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DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

RIN 0648-XC762

Takes of Marine Mammals Incidental to Specified Activities; Taking Marine Mammals Incidental to a Wharf Recapitalization Project

AGENCY: National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA), Commerce.

ACTION: Notice; issuance of an incidental harassment authorization.

SUMMARY: In accordance with the regulations implementing the Marine Mammal Protection Act (MMPA) as amended, notification is hereby given that we have issued an incidental harassment authorization (IHA) to the U.S. Navy (Navy) to incidentally harass, by Level B harassment only, two species of marine mammals during construction activities associated with a wharf recapitalization project at Naval Station Mayport, Florida.

DATES: This authorization is effective from December 1, 2013, through November 30, 2014.

ADDRESSES: A copy of the Navy's application and any supporting documents, as well as a list of the references cited in this document, may be obtained by visiting the internet at:

<http://www.nmfs.noaa.gov/pr/permits/incidental.htm>. In the case of problems accessing these documents, please call the contact listed below. A memorandum describing our adoption of the Navy's Environmental Assessment (2013) and our associated Finding of No Significant Impact, prepared pursuant to the National Environmental Policy Act, are also available at the same site.

FOR FURTHER INFORMATION CONTACT: Ben Laws, Office of Protected Resources, NMFS, (301) 427-8401.

SUPPLEMENTARY INFORMATION:

Background

Sections 101(a)(5)(A) and (D) of the MMPA (16 U.S.C. 1361 et seq.) direct the Secretary of Commerce to allow, upon request by U.S. citizens who engage in a specified activity (other than commercial fishing) within a specified area, the incidental, but not intentional, taking of small numbers of marine mammals, providing that certain findings are made and the necessary prescriptions are established.

The incidental taking of small numbers of marine mammals may be allowed only if NMFS (through authority delegated by the Secretary) finds that the total taking by the specified activity during the specified time period will (i) have a negligible impact on the species or stock(s) and (ii) not have an unmitigable adverse impact on the availability of the species or stock(s) for subsistence uses (where relevant). Further, the permissible methods of taking and requirements pertaining to the mitigation, monitoring and reporting of such taking must be set forth, either in specific regulations or in an authorization.

The allowance of such incidental taking under section 101(a)(5)(A), by harassment, serious injury, death or a combination thereof, requires that regulations be established. Subsequently, a Letter of Authorization may be issued pursuant to the prescriptions established in such regulations, providing that the level of taking will be consistent with the findings made for the total taking allowable under the specific regulations. Under section 101(a)(5)(D), NMFS may authorize such incidental taking by harassment only, for periods of not more than 1 year, pursuant to requirements and conditions contained within an Incidental Harassment Authorization. The establishment of prescriptions through either specific regulations or an authorization requires notice and opportunity for public comment.

NMFS has defined “negligible impact” in 50 CFR 216.103 as “...an impact resulting from the specified activity that cannot be reasonably expected to, and is not reasonably likely to, adversely affect the species or stock through effects on annual rates of recruitment or survival.” Except with respect to certain activities not pertinent here, section 3(18) of the MMPA defines “harassment” as: “...any act of pursuit, torment, or annoyance which (i) has the potential to injure a marine mammal or marine mammal stock in the wild; or (ii) has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering.” The former is termed Level A harassment and the latter is termed Level B harassment.

Summary of Request

On April 4, 2013, we received a request from the Navy for authorization of the taking, by Level B harassment only, of marine mammals incidental to pile driving in association with the Wharf C-2 recapitalization project at Naval Station Mayport, Florida (NSM). That request was modified on May 9 and June 5, 2013, and a final version, which we deemed adequate and complete, was submitted on August 7, 2013. In-water work associated with the project is expected to be completed within the one-year timeframe of the IHA (December 1, 2013 through November 30, 2014). Two species of marine mammal are expected to be affected by the specified activities: bottlenose dolphin (*Tursiops truncatus truncatus*) and Atlantic spotted dolphin (*Stenella frontalis*). These species may occur year-round in the action area.

Wharf C-2 is a single level, general purpose berthing wharf constructed in 1960. The wharf is one of NSM’s two primary deep-draft berths and is one of the primary ordnance handling wharfs. The wharf is a diaphragm steel sheet pile cell structure with a concrete apron,

partial concrete encasement of the piling and an asphalt paved deck. The wharf is currently in poor condition due to advanced deterioration of the steel sheeting and lack of corrosion protection, and this structural deterioration has resulted in the institution of load restrictions within 60 ft of the wharf face. The purpose of this project is to complete necessary repairs to Wharf C-2. Please refer to Appendix A of the Navy's application for photos of existing damage and deterioration at the wharf, and to Appendix B for a contractor schematic of the project plan.

Effects to marine mammals from the specified activity are expected to result from underwater sound produced by vibratory and impact pile driving. In order to assess project impacts, the Navy used thresholds recommended by NMFS, outlined later in this document. The Navy assumed practical spreading loss and used empirically-measured source levels from representative pile driving events to estimate potential marine mammal exposures. Predicted exposures are described later in this document. The calculations predict that only Level B harassment would occur associated with pile driving activities, and required mitigation measures further ensure that no more than Level B harassment would occur.

Description of the Specified Activity

Additional details regarding the specified activity were described in our Federal Register notice of proposed authorization (78 FR 52148; August 22, 2013; hereafter, the FR notice); please see that document or the Navy's application for more information.

Specific Geographic Region and Duration

NSM is located in northeastern Florida, at the mouth of the St. Johns River and adjacent to the Atlantic Ocean (see Figure 2-1 of the Navy's application). The specific action area consists of the NSM turning basin, an area of approximately 2,000 by 3,000 ft containing ship berthing facilities at sixteen locations along wharves around the basin perimeter. The turning basin,

connected to the St. Johns River by a 500-ft-wide entrance channel, will largely contain sound produced by project activities, with the exception of sound propagating east into nearshore Atlantic waters through the entrance channel (see Figure 2-2 of the Navy's application). Wharf C-2 is located in the northeastern corner of the Mayport turning basin.

The project is expected to require a maximum of 50 days of in-water vibratory pile driving work over a 12-month period. It is not expected that significant impact pile driving would be necessary, on the basis of expected subsurface driving conditions and past experience driving piles in the same location. However, twenty additional days of impact pile driving are included in the specified activity as a contingency, for a total of 70 days in-water pile driving considered over the 12-month timeframe of the proposed IHA.

Description of Specified Activity

In order to rehabilitate Wharf C-2, the Navy proposes to install a new steel king pile/sheet pile (SSP) bulkhead. An SSP system consists of large vertical king piles with paired steel sheet piles driven inbetween and connected to the ends of the king piles. Please see Figures 1-1 through 1-4 and Table 1-1 in the Navy's application for project schematics, descriptive photographs, and further information about the pile types to be used.

The project will require installation of approximately 120 single sheet piles and 119 king piles (all steel) to support the bulkhead wall, and fifty polymeric (plastic) fender piles. Vibratory installation of the steel piles will require approximately 45 days, with approximately 5 additional days needed for vibratory installation of the plastic piles. King piles are long I-shaped guide piles that provide the structural support for the bulkhead wall. Sheet piles, which form the actual wall, will be driven in pairs between the king piles. Once piles are in position, it is expected that less than 60 seconds of vibratory driving would be required per pile to reach the required depth. Time

interval between driving of each pile pair will vary, but is expected to be a minimum of several minutes due to time required for positioning, etc. One template consists of the combination of five king piles and four sheet pile pairs; it is expected that three such templates may be driven per day. Polymeric fender piles will be installed after completion of the bulkhead, at an expected rate of approximately ten piles per day.

Impact pile driving is not expected to be required for most piles, but may be used as a contingency in cases when vibratory driving is not sufficient to reach the necessary depth. A similar project completed at an adjacent wharf required impact pile driving on only seven piles (over the course of two days). Impact pile driving, if it were required, could occur on the same day as vibratory pile driving, but driving rigs would not be operated simultaneously.

Description of Sound Sources and Distances to Thresholds

An in-depth description of sound sources in general was provided in the FR notice (78 FR 52148; August 22, 2013). Significant sound-producing in-water construction activities associated with the project include vibratory pile driving and potentially impact pile driving.

Sound Thresholds

NMFS currently uses acoustic exposure thresholds as important tools to help better characterize and quantify the effects of human-induced noise on marine mammals. These thresholds have predominantly been presented in the form of single received levels for particular source categories (e.g., impulse, continuous, or explosive) above which an exposed animal would be predicted to incur auditory injury or be behaviorally harassed. Current NMFS practice (in relation to the MMPA) regarding exposure of marine mammals to sound is that cetaceans and pinnipeds exposed to sound levels of 180 and 190 dB rms or above, respectively, are considered to have been taken by Level A (i.e., injurious) harassment, while behavioral harassment (Level

B) is considered to have occurred when marine mammals are exposed to sounds at or above 120 dB rms for continuous sound (such as will be produced by vibratory pile driving) and 160 dB rms for pulsed sound (produced by impact pile driving), but below injurious thresholds. NMFS uses these levels as guidelines to estimate when harassment may occur.

NMFS is in the process of revising these acoustic thresholds, with the first step being to identify new auditory injury criteria for all source types and new behavioral criteria for seismic activities (primarily airgun-type sources). For more information on that process, please visit <http://www.nmfs.noaa.gov/pr/acoustics/guidelines.htm>.

Distance to Sound Thresholds

Pile driving generates underwater noise that can potentially result in disturbance to marine mammals in the project area. Please see the FR notice (78 FR 52148; August 22, 2013) for a detailed description of the calculations and information used to estimate distances to relevant threshold levels. In general, the sound pressure level (SPL) at some distance away from the source (e.g., driven pile) is governed by a measured source level, minus the transmission loss of the energy as it dissipates with distance. A practical spreading value of 15 (4.5 dB reduction in sound level for each doubling of distance) is often used under intermediate conditions, and is assumed here.

Source level, or the intensity of pile driving sound, is greatly influenced by factors such as the type of piles, hammers, and the physical environment in which the activity takes place. A number of studies, primarily on the west coast, have measured sound produced during underwater pile driving projects. However, these data are largely for impact driving of steel pipe piles and concrete piles as well as vibratory driving of steel pipe piles. We know of no existing measurements for the specific pile types planned for use at NSM (i.e., king piles, paired sheet

piles, plastic pipe piles), although some data exist for single sheet piles. It was therefore necessary to extrapolate from available data to determine reasonable source levels for this project.

Representative data for pile driving SPLs recorded from similar construction activities in recent years, as well as additional assumptions made in determining appropriate proxy values, were presented in the FR notice (78 FR 52148; August 22, 2013). Underwater sound levels from pile driving for this project are assumed to be as follows:

- For vibratory driving of steel sheet and king piles, 178 dB re 1 μ Pa (rms). This proxy value was the highest representative value for vibratory driving of steel sheet piles and appropriately-sized steel pipe piles found in the California Department of Transportation's compendium of pile driving data (Caltrans, 2012).
- For impact driving of steel sheet and king piles, 204 dB re 1 μ Pa (rms). This proxy value was deemed to be the most representative value for impact driving of appropriately-sized steel pipe piles, as found in the California Department of Transportation's compendium of pile driving data.
- For vibratory driving of polymeric piles 168 dB re 1 μ Pa (rms). This proxy value, measured by the Washington State Department of Transportation for vibratory removal of timber piles, was determined to be the only reasonable approximation of these pile types (Laughlin, 2011).

Please see Tables 6-3 and 6-4 in the Navy's application. All calculated distances to and the total area encompassed by the marine mammal sound thresholds are provided in Table 1.

Pile type	Method	Threshold	Distance (m) ¹	Area (sq. km) ²
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Steel (sheet and king piles)	Vibratory	Level A harassment (180 dB)	n/a	0
		Level B harassment (120 dB)	7,356	2.9
	Impact	Level A harassment (180 dB)	40	0.004
		Level B harassment (160 dB)	858	0.67
Polymeric (plastic fender piles)	Vibratory	Level A harassment (180 dB)	n/a	0
		Level B harassment (120 dB)	1,585	0.88

¹ SPLs (levels at source) used for calculations were: 204 dB for impact driving, 178 dB for vibratory driving steel piles, and 168 dB for vibratory driving plastic piles.

² Areas presented take into account attenuation and/or shadowing by land. Calculated distances to relevant thresholds cannot be reached in most directions from source piles. Please see Figures 6-1 through 6-3 in the Navy's application.

Table 1. Calculated distance(s) to and area encompassed by underwater marine mammal sound thresholds during pile installation

The Mayport turning basin does not represent open water, or free field, conditions.

Therefore, sounds would attenuate as per the confines of the basin, and may only reach the full estimated distances to the harassment thresholds via the narrow, east-facing entrance channel.

Distances shown in Table 1 are estimated for free-field conditions, but areas are calculated per the actual conditions of the action area. See Figures 6-1 through 6-3 of the Navy's application for a depiction of areas in which each underwater sound threshold is predicted to occur at the project area due to pile driving.

Comments and Responses

We published a notice of receipt of the Navy's application and proposed IHA in the Federal Register on August 22, 2013 (78 FR 52148). NMFS received comments from the Marine Mammal Commission (Commission). The Commission's comments and our responses are provided here, and the comments have been posted on the internet at:

<http://www.nmfs.noaa.gov/pr/permits/incidental.htm>.

Comment 1: The Commission recommends that we require the Navy to implement soft start procedures if impact pile driving activities have ceased for at least 15 minutes.

Response: We do not believe the recommendation would be effective in reducing the number or intensity of incidents of harassment – in fact, we believe that implementation of this recommendation may actually increase the number of incidents of harassment by extending the overall project duration – while imposing a high cost in terms of operational practicability. We note here that, while the Commission recommends use of the measure to avoid serious injury (i.e., injury that will result in death of the animal), such an outcome is extremely unlikely even in the absence of any mitigation measures (as described in the FR notice). Therefore, we address our response to the potential usefulness of the measure in avoidance of non-serious injury (i.e., Level A harassment).

Soft start is required for the first impact pile driving of each day and, subsequently, after any impact pile driving stoppage of 30 minutes or greater. The purpose of a soft start is to provide a “warning” to animals by initiating the production of underwater sound at lower levels than are produced at full operating power. This warning is presumed to allow animals the opportunity to move away from an unpleasant stimulus and to potentially reduce the intensity of behavioral reactions to noise or prevent injury of animals that may remain undetected in the zone ensonified to potentially injurious levels. However, soft start requires additional time, resulting in a larger temporal footprint for the project. That is, soft start requires a longer cumulative period of pile driving (i.e., hours) but, more importantly, leads to a longer overall duration (i.e., more days on which pile driving occurs). In order to maximize the effectiveness of soft start while minimizing the implementation costs, we require soft start after a period of extended and unobserved relative silence (i.e., at the beginning of the day, after the end of the required 30-

minute post-activity monitoring period, or after 30 minutes with no impact driving). It is after these periods that marine mammals are more likely to closely approach the site (because it is relatively quiet) and less likely to be observed prior to initiation of the activity (because continuous monitoring has been interrupted).

The Commission justifies this recommendation on the basis of the potential for undetected animals to remain in the shutdown zone. This may occur because an animal remains submerged and is not available to be observed, because dolphins occur singly or in pairs and are difficult to perceive, or because the observer simply does not detect the animal in the period when it surfaces and is available to be observed. However, we do not believe that time is a factor in determining the influence of these biases on the probability of observing an animal in the shutdown zone. That is, an observer is not more likely to detect the presence of an animal at the 15-minute mark of continuous monitoring than after 30 minutes (it is established that soft start is required after any unmonitored period). Therefore, requiring soft start after 15 minutes (i.e., more soft starts) is not likely to result in increased avoidance of injury. Finally, we do not believe that the use of soft start may be expected to appreciably reduce the potential for injury where the probability of detection is high (e.g., small, shallow zones with good environmental conditions). Rather, the primary purpose of soft start under such conditions is to reduce the intensity of potential behavioral reactions to underwater sound in the disturbance zone.

As noted above, there are multiple reasons why marine mammals may remain in a shutdown zone and yet be undetected by observers. Animals are missed because they are underwater (availability bias) or because they are available to be seen, but are missed by observers (perception and detection biases) (e.g., Marsh and Sinclair, 1989). Negative bias on perception or detection of an available animal may result from environmental conditions,

limitations inherent to the observation platform, or observer ability. While missed detections are possible in theory, this would require that an animal would either (a) remain submerged (i.e., be unavailable) for periods of time approaching or exceeding 15 minutes and/or (b) remain undetected while at the surface. We provide further site-specific detail below.

First, the Mayport turning basin is an enclosed area, and provides a relatively sheltered environment and circumscribed area of observation. We would therefore expect a high probability of detection given an animal at the surface and multiple well-positioned observers. Unlike the moving aerial or vessel-based observation platforms for which detectability bias is often a concern, the observers here will be positioned in the most suitable locations to ensure high detectability (randomness of observations is not a concern, as it is for abundance sampling). Regarding availability, the only species likely to be present in the turning basin is the bottlenose dolphin.

For bottlenose dolphins, while a significant proportion of time is typically spent submerged, dive intervals are also typically very short, meaning that surfacing occurs frequently. Mate et al. (1995) report a typical dive duration from another shallow bay (Tampa Bay) of only 25 seconds. While bottlenose dolphins may display deeper dive times in other contexts (e.g., deep-water foraging), there is no conceivable reason why a dolphin would remain submerged for durations approaching 15 minutes in the turning basin (i.e., a shallow environment of no particular significance for foraging). Short dive duration means high availability, providing additional confidence in the ability of observers to detect marine mammals in the shutdown zones estimated for this project.

Comment 2: The Commission recommends that we require the Navy to monitor the extent of the Level B harassment zones by strategically positioning the observers (e.g., one

monitoring the immediate shutdown zone and portions of the turning basin and the other monitoring portions of the turning basin, the entrance to that basin, and portions of the Atlantic Ocean) to (1) determine more accurately the numbers of marine mammals taken during pile driving activities and (2) characterize the effects on those marine mammals.

Response: We support the Commission's recommendation, and agree that the recommended changes to the Navy's Monitoring Plan could be useful in achieving a more accurate (1) determination of the numbers of marine mammals taken during pile driving activities and (2) characterization of the effects on those marine mammals. One existing observer will be required to observe the turning basin, the entrance to that basin, and portions of the Atlantic Ocean, to the extent possible. In addition, we will require a third shore-based observer be present for three days of vibratory driving, to be focused solely on the entrance to the turning basin and surrounding, observable portions of the Atlantic Ocean that may be ensonified by project activities.

Description of Marine Mammals in the Area of the Specified Activity

There are four marine mammal species which may inhabit or transit through the waters nearby NSM at the mouth of the St. Johns River and in nearby nearshore Atlantic waters. These include the bottlenose dolphin, Atlantic spotted dolphin, North Atlantic right whale (Eubalaena glacialis), and humpback whale (Megaptera novaeangliae). Multiple stocks of bottlenose dolphins may be present in the action area, either seasonally or year-round. Multiple additional cetacean species occur in South Atlantic waters but would not be expected to occur in shallow nearshore waters of the action area. The right and humpback whales are both listed under the Endangered Species Act (ESA) as endangered; however, for reasons described in the FR notice (78 FR 52148; August 22, 2013), the humpback whale and right whale are not expected to be

harassed by project activities and are therefore excluded from further analysis and not discussed further in this document. Table 2 lists the marine mammal species with potential for occurrence in the vicinity of NSM during the project timeframe. The FR notice (78 FR 52148; August 22, 2013) summarizes the population status and abundance of these species, and the Navy's application provides detailed life history information.

Species	Stock abundance ¹ (CV, N _{min})	Relative occurrence in action area	Season of occurrence
North Atlantic right whale Western North Atlantic stock	444 (n/a, 444)	Rare inshore, regular near/offshore	November to April
Humpback whale Gulf of Maine stock	823 (n/a, 823)	Rare	Fall-Spring
Atlantic spotted dolphin Western North Atlantic stock	26,798 (0.66, 16,151)	Rare	Year-round
Bottlenose dolphin Western North Atlantic offshore stock	81,588 (0.17, 70,775)	Rare	Year-round
Bottlenose dolphin Western North Atlantic coastal, southern migratory stock	12,482 (0.32, 9,591)	Possibly common (seasonal)	January to March
Bottlenose dolphin Western North Atlantic coastal, northern Florida stock	3,064 (0.24, 2,511)	Possibly common	Year-round
Bottlenose dolphin Jacksonville Estuarine System stock	412 ² (0.06, unknown)	Possibly common	Year-round

¹ NMFS marine mammal stock assessment reports at: <http://www.nmfs.noaa.gov/pr/sars/species.htm>. CV is coefficient of variation; N_{min} is the minimum estimate of stock abundance.

² This abundance estimate is considered an overestimate because it includes non- and seasonally-resident animals.

Table 2. Marine mammals potentially present in the vicinity of NSM

Potential Effects of the Specified Activity on Marine Mammals

We have determined that pile driving, as outlined in the project description, has the potential to result in behavioral harassment of marine mammals that may be present in the project vicinity while construction activity is being conducted. The FR notice (78 FR 52148;

August 22, 2013) provides a detailed description of marine mammal hearing and of the potential effects of these construction activities on marine mammals.

Anticipated Effects on Habitat

The proposed activities at NSM would not result in permanent impacts to habitats used directly by marine mammals, but may have potential short-term impacts to food sources such as forage fish and may affect acoustic habitat (see masking discussion in proposed IHA FR notice). There are no known foraging hotspots or other ocean bottom structure of significant biological importance to marine mammals present in the marine waters in the vicinity of the project area. Therefore, the main impact issue associated with the proposed activity would be temporarily elevated sound levels and the associated direct effects on marine mammals, as discussed previously in this document. The most likely impact to marine mammal habitat occurs from pile driving effects on likely marine mammal prey (i.e., fish) near NSM and minor impacts to the immediate substrate during installation and removal of piles during the wharf construction project. The FR notice (78 FR 52148; August 22, 2013) describes these potential impacts in greater detail.

Mitigation

In order to issue an incidental take authorization (ITA) under section 101(a)(5)(D) of the MMPA, we must set forth the permissible methods of taking pursuant to such activity, and other means of effecting the least practicable impact on such species or stock and its habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance, and on the availability of such species or stock for taking for certain subsistence uses (where relevant).

Measurements from proxy pile driving events were coupled with practical spreading loss to estimate zones of influence (ZOIs; see “Estimated Take by Incidental Harassment”); these

values were used to develop mitigation measures for pile driving activities at NSM. The ZOIs effectively represent the mitigation zone that would be established around each pile to prevent Level A harassment to marine mammals, while providing estimates of the areas within which Level B harassment might occur. In addition to the specific measures described later in this section, the Navy will conduct briefings between construction supervisors and crews, marine mammal monitoring team, and Navy staff prior to the start of all pile driving activity, and when new personnel join the work, in order to explain responsibilities, communication procedures, marine mammal monitoring protocol, and operational procedures.

Monitoring and Shutdown for Pile Driving

The following measures apply to the Navy's mitigation through shutdown and disturbance zones:

Shutdown Zone – For all pile driving and removal activities, the Navy will establish a shutdown zone intended to contain the area in which SPLs equal or exceed the 180 dB rms acoustic injury criteria. The purpose of a shutdown zone is to define an area within which shutdown of activity would occur upon sighting of a marine mammal (or in anticipation of an animal entering the defined area), thus preventing injury, serious injury, or death of marine mammals. Radial distances for shutdown zones are shown in Table 1. However, for this project, a minimum shutdown zone of 15 m will be established during all pile driving activities, regardless of the estimated zone. Vibratory pile driving activities are not predicted to produce sound exceeding the Level A standard, but these precautionary measures are intended to prevent the already unlikely possibility of physical interaction with construction equipment and to further reduce any possibility of acoustic injury. For impact driving of steel piles, the radial distance of the shutdown would be established at 40 m (Table 1).

Disturbance Zone – Disturbance zones are the areas in which SPLs equal or exceed 160 and 120 dB rms (for pulsed and non-pulsed sound, respectively). Disturbance zones provide utility for monitoring conducted for mitigation purposes (i.e., shutdown zone monitoring) by establishing monitoring protocols for areas adjacent to the shutdown zones. Monitoring of disturbance zones enables observers to be aware of and communicate the presence of marine mammals in the project area but outside the shutdown zone and thus prepare for potential shutdowns of activity. However, the primary purpose of disturbance zone monitoring is for documenting incidents of Level B harassment; disturbance zone monitoring is discussed in greater detail later (see “Monitoring and Reporting”). Nominal radial distances for disturbance zones are shown in Table 1. Given the size of the disturbance zone for vibratory pile driving, it is impossible to guarantee that all animals would be observed or to make comprehensive observations of fine-scale behavioral reactions to sound, and only a portion of the zone (e.g., what may be reasonably observed by visual observers stationed on land in the vicinity of the turning basin) will be observed.

In order to document observed incidences of harassment, monitors record all marine mammal observations, regardless of location. The observer’s location, as well as the location of the pile being driven, is known from a GPS. The location of the animal is estimated as a distance from the observer, which is then compared to the location from the pile. If acoustic monitoring is being conducted for that pile, a received SPL may be estimated, or the received level may be estimated on the basis of past or subsequent acoustic monitoring. It may then be determined whether the animal was exposed to sound levels constituting incidental harassment in post-processing of observational and acoustic data, and a precise accounting of observed incidences of harassment created. Therefore, although the predicted distances to behavioral harassment

thresholds are useful for estimating incidental harassment for purposes of authorizing levels of incidental take, actual take may be determined in part through the use of empirical data. That information may then be used to extrapolate observed takes to reach an approximate understanding of actual total takes.

Monitoring Protocols – Monitoring will be conducted before, during, and after pile driving activities. In addition, observers shall record all incidences of marine mammal occurrence, regardless of distance from activity, and shall document any behavioral reactions in concert with distance from piles being driven. Observations made outside the shutdown zone will not result in shutdown; that pile segment would be completed without cessation, unless the animal approaches or enters the shutdown zone, at which point all pile driving activities would be halted. Please see the Monitoring Plan (available at <http://www.nmfs.noaa.gov/pr/permits/incidental.htm>), developed by the Navy in agreement with NMFS, for full details of the monitoring protocols. Monitoring will take place from 15 minutes prior to initiation through 30 minutes post-completion of pile driving activities. Pile driving activities include the time to remove a single pile or series of piles, as long as the time elapsed between uses of the pile driving equipment is no more than 30 minutes.

The following additional measures apply to visual monitoring:

- (1) Monitoring will be conducted by qualified observers, who will be placed at the best vantage point(s) practicable to monitor for marine mammals and implement shutdown/delay procedures when applicable by calling for the shutdown to the hammer operator. Qualified observers are typically trained biologists, with the following minimum qualifications:

- Visual acuity in both eyes (correction is permissible) sufficient for discernment of moving targets at the water's surface with ability to estimate target size and distance; use of binoculars may be necessary to correctly identify the target;
- Advanced education in biological science, wildlife management, mammalogy, or related fields (bachelor's degree or higher is required);
- Experience and ability to conduct field observations and collect data according to assigned protocols (this may include academic experience);
- Experience or training in the field identification of marine mammals, including the identification of behaviors;
- Sufficient training, orientation, or experience with the construction operation to provide for personal safety during observations;
- Writing skills sufficient to prepare a report of observations including but not limited to the number and species of marine mammals observed; dates and times when in-water construction activities were conducted; dates and times when in-water construction activities were suspended to avoid potential incidental injury from construction sound of marine mammals observed within a defined shutdown zone; and marine mammal behavior; and
- Ability to communicate orally, by radio or in person, with project personnel to provide real-time information on marine mammals observed in the area as necessary.

For this project, we waive the requirement for advanced education, as the observers will be personnel hired by the engineering contractor that may not have backgrounds in biological science or related fields. These observers will be required to watch the Navy's Marine Species

Awareness Training video and shall receive training sufficient to achieve all other qualifications listed above (where relevant).

(2) Prior to the start of pile driving activity, the shutdown zone will be monitored for 15 minutes to ensure that it is clear of marine mammals. Pile driving will only commence once observers have declared the shutdown zone clear of marine mammals; animals will be allowed to remain in the shutdown zone (i.e., must leave of their own volition) and their behavior will be monitored and documented. The shutdown zone may only be declared clear, and pile driving started, when the entire shutdown zone is visible (i.e., when not obscured by dark, rain, fog, etc.). In addition, if such conditions should arise during impact pile driving that is already underway, the activity will be halted.

(3) If a marine mammal approaches or enters the shutdown zone during the course of pile driving operations, activity will be halted and delayed until either the animal has voluntarily left and been visually confirmed beyond the shutdown zone or 15 minutes have passed without re-detection of the animal. Monitoring will be conducted throughout the time required to drive a pile.

Soft Start

The use of a soft-start procedure is believed to provide additional protection to marine mammals by warning or providing a chance to leave the area prior to the hammer operating at full capacity, and typically involves a requirement to initiate sound from vibratory hammers for fifteen seconds at reduced energy followed by a 30-second waiting period. This procedure is repeated two additional times. However, implementation of soft start for vibratory pile driving during previous pile driving work conducted by the Navy at another location has led to equipment failure and serious human safety concerns. Therefore, vibratory soft start is not

required as a mitigation measure for this project, as we have determined it not to be practicable. We have further determined this measure unnecessary to providing the means of effecting the least practicable impact on marine mammals and their habitat. Prior to issuing any further IHAs to the Navy for pile driving activities in 2014 and beyond, we plan to facilitate consultation between the Navy and other practitioners (e.g., Washington State Department of Transportation and/or the California Department of Transportation) in order to determine whether the potentially significant human safety issue is inherent to implementation of the measure or is due to operator error. For impact driving, soft start will be required, and contractors will provide an initial set of three strikes from the impact hammer at 40 percent energy, followed by a 30-second waiting period, then two subsequent three-strike sets.

We have carefully evaluated the applicant's planned mitigation measures and considered a range of other measures in the context of ensuring that we prescribe the means of effecting the least practicable impact on the affected marine mammal species and stocks and their habitat. Our evaluation of potential measures included consideration of the following factors in relation to one another: (1) the manner in which, and the degree to which, the successful implementation of the measure is expected to minimize adverse impacts to marine mammals; (2) the proven or likely efficacy of the specific measure to minimize adverse impacts as planned; and (3) the practicability of the measure for applicant implementation.

Based on our evaluation of the applicant's planned measures, as well as any other potential measures that may be relevant to the specified activity, we have determined that these mitigation measures provide the means of effecting the least practicable impact on marine mammal species or stocks and their habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance.

Monitoring and Reporting

In order to issue an ITA for an activity, section 101(a)(5)(D) of the MMPA states that we must set forth “requirements pertaining to the monitoring and reporting of such taking”. The MMPA implementing regulations at 50 CFR 216.104 (a)(13) indicate that requests for ITAs must include the suggested means of accomplishing the necessary monitoring and reporting that will result in increased knowledge of the species and of the level of taking or impacts on populations of marine mammals that are expected to be present in the proposed action area. The Navy’s planned monitoring and reporting is also described in their Marine Mammal Monitoring Plan.

Acoustic Monitoring

The Navy will implement a sound source level verification study during the specified activities. Data would be collected in order to estimate airborne and underwater source levels. Monitoring will include two underwater positions and one airborne monitoring position. These exact positions will be determined in the field during consultation with Navy personnel, subject to constraints related to logistics and security requirements. Underwater sound monitoring will include the measurement of peak and rms sound pressure levels during pile driving activities at Wharf C-2. Typical ambient levels will be measured during lulls in the pile installation and reported in terms of rms sound pressure levels. Frequency spectra will be provided for pile driving sounds.

Visual Marine Mammal Observations

The Navy will collect sighting data and behavioral responses to construction for marine mammal species observed in the region of activity during the period of activity. All observers will be trained in marine mammal identification and behaviors and are required to have no other

construction-related tasks while conducting monitoring. The Navy will monitor the shutdown zone and disturbance zone before, during, and after pile driving, with observers located at the best practicable vantage points. Based on our requirements, the Navy will implement the following procedures for pile driving:

- MMOs will be located at the best vantage point(s) in order to properly see the entire shutdown zone and as much of the disturbance zone as possible.
- During all observation periods, observers will use binoculars and the naked eye to search continuously for marine mammals.
- If the shutdown zones are obscured by fog or poor lighting conditions, pile driving at that location will not be initiated until that zone is visible. Should such conditions arise while impact driving is underway, the activity would be halted.
- The shutdown and disturbance zones around the pile will be monitored for the presence of marine mammals before, during, and after any pile driving or removal activity.

Individuals implementing the monitoring protocol will assess its effectiveness using an adaptive approach. Monitoring biologists will use their best professional judgment throughout implementation and seek improvements to these methods when deemed appropriate. Any modifications to protocol will be coordinated between NMFS and the Navy.

Data Collection

We require that observers use approved data forms. Among other pieces of information, the Navy will record detailed information about any implementation of shutdowns, including the distance of animals to the pile and description of specific actions that ensued and resulting behavior of the animal, if any. In addition, the Navy will attempt to distinguish between the

number of individual animals taken and the number of incidences of take. We require that, at a minimum, the following information be collected on the sighting forms:

- Date and time that monitored activity begins or ends;
- Construction activities occurring during each observation period;
- Weather parameters (e.g., percent cover, visibility);
- Water conditions (e.g., sea state, tide state);
- Species, numbers, and, if possible, sex and age class of marine mammals;
- Description of any observable marine mammal behavior patterns, including

bearing and direction of travel, and if possible, the correlation to SPLs;

- Distance from pile driving activities to marine mammals and distance from the marine mammals to the observation point;

- Locations of all marine mammal observations; and
- Other human activity in the area.

Reporting

A draft report will be submitted to NMFS within 90 days of the completion of marine mammal monitoring. The report will include marine mammal observations pre-activity, during-activity, and post-activity during pile driving days, and will also provide descriptions of any adverse responses to construction activities by marine mammals and a complete description of all mitigation shutdowns and the results of those actions and a refined take estimate based on the number of marine mammals observed during the course of construction. A final report will be prepared and submitted within 30 days following resolution of comments on the draft report. A

technical report summarizing the acoustic monitoring data collected will be prepared within 75 days of completion of monitoring.

Estimated Take by Incidental Harassment

With respect to the activities described here, the MMPA defines "harassment" as: "any act of pursuit, torment, or annoyance which (i) has the potential to injure a marine mammal or marine mammal stock in the wild [Level A harassment]; or (ii) has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering [Level B harassment]." All anticipated takes will be by Level B harassment, involving temporary changes in behavior. The planned mitigation and monitoring measures are expected to minimize the possibility of injurious or lethal takes such that take by Level A harassment, serious injury, or mortality is considered discountable. However, it is unlikely that injurious or lethal takes would occur even in the absence of the proposed mitigation and monitoring measures.

If a marine mammal responds to a stimulus by changing its behavior (e.g., through relatively minor changes in locomotion direction/speed or vocalization behavior), the response may or may not constitute taking at the individual level, and is unlikely to affect the stock or the species as a whole. However, if a sound source displaces marine mammals from an important feeding or breeding area for a prolonged period, impacts on animals or on the stock or species could potentially be significant (Lusseau and Bejder, 2007; Weilgart, 2007). Given the many uncertainties in predicting the quantity and types of impacts of sound on marine mammals, it is common practice to estimate how many animals are likely to be present within a particular distance of a given activity, or exposed to a particular level of sound. This practice potentially overestimates the numbers of marine mammals taken. In addition, it is often difficult to

distinguish between the number of individuals harassed and incidences of harassment. In particular, for stationary activities, it is more likely that some smaller number of individuals may accrue a number of incidences of harassment per individual than for each incidence to accrue to a new individual, especially if those individuals display some degree of residency or site fidelity and the impetus to use the site (e.g., because of foraging opportunities) is stronger than the deterrence presented by the harassing activity.

The turning basin is not important habitat for marine mammals, as it is a man-made, semi-enclosed basin with frequent industrial activity and regular maintenance dredging. The small area of ensonification extending out of the turning basin into nearshore waters is also not believed to be of any particular importance, nor is it considered an area frequented by marine mammals. Bottlenose dolphins may be observed at any time of year in estuarine and nearshore waters of the action area, but sightings of other species are rare. Therefore, behavioral disturbances that could result from anthropogenic sound associated with these activities are expected to affect only a relatively small number of individual marine mammals, although those effects could be recurring over the life of the project if the same individuals remain in the project vicinity. The Navy has requested authorization for the incidental taking of small numbers of bottlenose dolphins and Atlantic spotted dolphins in the Mayport turning basin and associated nearshore waters that may be ensonified by project activities.

Marine Mammal Densities

For all species, the best scientific information available was used to derive density estimates and the maximum appropriate density value for each species was used in the marine mammal take assessment calculation. Density values for the Atlantic spotted dolphin were derived from global density estimates produced by Sea Mammal Research Unit, Ltd. (SMRU), as

presented in DoN (2012), and the highest seasonal density (spring; $0.6803/\text{km}^2$) was used for take estimation. Density for bottlenose dolphin is derived from site-specific surveys conducted by the Navy. Only bottlenose dolphins have been observed in the turning basin; it is not currently possible to identify observed individuals to stock. This survey effort consists of twelve half-day observation periods covering mornings and afternoons during December 10-13, 2012, and March 4-7, 2013. During each observation period, two observers (one at ground level and one positioned at a fourth-floor observation point) monitored for the presence of marine mammals in the turning basin (0.712 km^2) and tracked their movements and behavior while inside the basin, with observations recorded for five-minute intervals every half-hour. Morning sessions typically ran from 7:00-11:30 and afternoon sessions from 1:00 to 5:30. Most observations were of individuals or pairs (mode of 1) although a maximum group size of six was observed. It was assumed that the average observed group size (1.8) could occur in the action area each day, and was thus used to calculate a density of $2.53/\text{km}^2$. For comparison, the maximum density value available from the NMSDD for bottlenose dolphins in inshore areas is significantly lower (winter, $0.217/\text{km}^2$, SMRU estimate) and would likely underestimate the occurrence of bottlenose dolphins in the turning basin.

Description of Take Calculation

The take calculations presented here rely on the best data currently available for marine mammal populations in the vicinity of Mayport. The methodology for estimating take was described in detail in the FR notice (78 FR 52148; August 22, 2013). The ZOI impact area is the estimated range of impact to the sound criteria. The distances specified in Table 1 were used to calculate ZOIs around each pile. The ZOI impact area calculations took into consideration the possible affected area with attenuation due to the constraints of the basin. Because the basin

restricts sound from propagating outward, with the exception of the east-facing entrance channel, the radial distances to thresholds cannot generally be reached.

While pile driving can occur any day, and the analysis is conducted on a per day basis, only a fraction of that time (typically a matter of hours on any given day) is actually spent pile driving. The exposure assessment methodology is an estimate of the numbers of individuals exposed to the effects of pile driving activities exceeding NMFS-established thresholds. Of note in these exposure estimates, mitigation methods (i.e., visual monitoring and the use of shutdown zones; soft start for impact pile driving) were not quantified within the assessment and successful implementation of mitigation is not reflected in exposure estimates. In addition, equating exposure with response (i.e., a behavioral response meeting the definition of take under the MMPA) is simplistic and conservative assumption. For these reasons, results from this acoustic exposure assessment likely overestimate take estimates to some degree.

Species	Activity	Estimated incidences of take ¹		Total
		Level A	Level B	
Bottlenose dolphin ²	Impact driving (steel piles)	0	40	365
	Vibratory driving (steel piles)	0	315	
	Vibratory driving (plastic piles)	0	10	
Atlantic spotted dolphin	Impact driving (steel piles)	0	0	95
	Vibratory driving (steel piles)	0	90	
	Vibratory driving (plastic piles)	0	5	

¹ Acoustic injury threshold is 180 dB for cetaceans; behavioral harassment threshold applicable to impact pile driving is 160 dB and to vibratory driving is 120 dB.

² It is impossible to estimate from available information which stock these takes may accrue to.

Table 3. Number of potential incidental takes of marine mammals within various acoustic threshold zones

Only bottlenose dolphins are likely to occur inside the turning basin; therefore, the estimates for spotted dolphin are likely overestimates because the ZOI areas include the turning

basin. Bottlenose dolphins are likely to be exposed to sound levels that could cause behavioral harassment if they enter the turning basin while pile driving activity is occurring. Outside the turning basin, potential takes could occur if individuals of these species move through the ensonified area when pile driving is occurring. It is not possible to determine, from available information, how many of the estimated incidences of take for bottlenose dolphins may accrue to the different stocks that may occur in the action area. Similarly, animals observed in the ensonified areas will not be able to be identified to stock on the basis of visual observation.

Negligible Impact and Small Numbers Analyses and Determinations

NMFS has defined "negligible impact" in 50 CFR 216.103 as "...an impact resulting from the specified activity that cannot be reasonably expected to, and is not reasonably likely to, adversely affect the species or stock through effects on annual rates of recruitment or survival." In making a negligible impact determination, we considers a variety of factors, including but not limited to: (1) the number of anticipated mortalities; (2) the number and nature of anticipated injuries; (3) the number, nature, intensity, and duration of Level B harassment; and (4) the context in which the take occurs.

Small Numbers Analysis

The number of incidences of take authorized for Atlantic spotted dolphins is small relative to the relevant stock – less than one percent. As described previously, of the 365 incidences of behavioral harassment predicted to occur for bottlenose dolphin, we have no information allowing us to parse those predicted incidences amongst the three stocks of bottlenose dolphin that may occur in the ensonified area. Therefore, we assessed the total number of predicted incidences of take against the best abundance estimate for each stock, as though the total would occur for the stock in question. For two of the bottlenose dolphin stocks, the total

predicted number of incidences of take authorized would be considered small – less than three percent for the southern migratory stock and less than twelve percent for the northern Florida coastal stock – even if each estimated taking occurred to a new individual. This is an extremely unlikely scenario as, for bottlenose dolphins in estuarine and nearshore waters, there is likely to be some overlap in individuals present day-to-day.

The total number of authorized takes proposed for bottlenose dolphins, if assumed to accrue solely to new individuals of the JES stock, is higher relative to the total stock abundance, which is currently considered unknown. However, these numbers represent the estimated incidences of take, not the number of individuals taken. That is, it is highly likely that a relatively small subset of JES bottlenose dolphins would be harassed by project activities. JES bottlenose dolphins range from Cumberland Sound at the Georgia-Florida border south to approximately Palm Coast, Florida, an area spanning over 120 linear km of coastline and including habitat consisting of complex inshore and estuarine waterways. JES dolphins, divided by Caldwell (2001) into Northern and Southern groups, show strong site fidelity and, although members of both groups have been observed outside their preferred areas, it is likely that the majority of JES dolphins would not occur within waters ensonified by project activities. Further, although the largest area of ensonification is predicted to extend up to 7.5 km offshore from NSM, estuarine dolphins are generally considered as restricted to inshore waters and only 1-2 km offshore. In summary, JES dolphins are (1) known to form two groups and exhibit strong site fidelity (i.e., individuals do not generally range throughout the recognized overall JES stock range); (2) would not occur at all in a significant portion of the larger ZOI extending offshore from NSM; and (3) the specified activity will be stationary within an enclosed basin not recognized as an area of any special significance that would serve to attract or aggregate dolphins. We therefore believe that

the estimated numbers of takes, were they to occur, likely represent repeated exposures of a much smaller number of bottlenose dolphins and that these estimated incidences of take represent small numbers of bottlenose dolphins.

Negligible Impact Analysis

Pile driving activities associated with the Navy's wharf project, as outlined previously, have the potential to disturb or displace marine mammals. Specifically, the specified activities may result in take, in the form of Level B harassment (behavioral disturbance) only, from underwater sounds generated from pile driving. Potential takes could occur if individuals of these species are present in the ensonified zone when pile driving is happening.

No injury, serious injury, or mortality is anticipated given the likely methods of installation and measures designed to minimize the possibility of injury to marine mammals. The potential for these outcomes is minimized through the construction method and the implementation of the planned mitigation measures. Specifically, vibratory hammers will be the primary method of installation, and this activity does not have significant potential to cause injury to marine mammals due to the relatively low source levels produced (less than 180 dB) and the lack of potentially injurious source characteristics. Impact pile driving produces short, sharp pulses with higher peak levels and much sharper rise time to reach those peaks. If impact driving is necessary, implementation of soft start and shutdown zones significantly reduces any possibility of injury. Given sufficient "notice" through use of soft start (for impact driving), marine mammals are expected to move away from a sound source that is annoying prior to its becoming potentially injurious. Environmental conditions in the confined and protected Mayport turning basin mean that marine mammal detection ability by trained observers is high, enabling a high rate of success in implementation of shutdowns to avoid injury, serious injury, or mortality.

Effects on individuals that are taken by Level B harassment, on the basis of reports in the literature as well as monitoring from other similar activities, will likely be limited to reactions such as increased swimming speeds, increased surfacing time, or decreased foraging (if such activity were occurring). Most likely, individuals will simply move away from the sound source and be temporarily displaced from the areas of pile driving, although even this reaction has been observed primarily only in association with impact pile driving. The pile driving activities analyzed here are similar to numerous other construction activities conducted in San Francisco Bay and in the Puget Sound region, which have taken place with no reported injuries or mortality to marine mammals, and no known long-term adverse consequences from behavioral harassment. Repeated exposures of individuals to levels of sound that may cause Level B harassment are unlikely to result in hearing impairment or to significantly disrupt foraging behavior. Thus, even repeated Level B harassment of some small subset of the overall stock is unlikely to result in any significant realized decrease in viability for bottlenose dolphins, and thus would not result in any adverse impact to the stock as a whole. Level B harassment will be reduced to the level of least practicable impact through use of mitigation measures described herein and, if sound produced by project activities is sufficiently disturbing, animals are likely to simply avoid the turning basin while the activity is occurring.

In summary, this negligible impact analysis is founded on the following factors: (1) the possibility of injury, serious injury, or mortality may reasonably be considered discountable; (2) the anticipated incidences of Level B harassment consist of, at worst, temporary modifications in behavior; (3) the absence of any significant habitat within the project area, including known areas or features of special significance for foraging or reproduction; (4) the presumed efficacy of the planned mitigation measures in reducing the effects of the specified activity to the level of

least practicable impact. In addition, none of these stocks are listed under the ESA, although coastal bottlenose dolphins are considered depleted under the MMPA. In combination, we believe that these factors, as well as the available body of evidence from other similar activities, demonstrate that the potential effects of the specified activity will have only short-term effects on individuals. The specified activity is not expected to impact rates of recruitment or survival and will therefore not result in population-level impacts.

Determinations

The number of marine mammals actually incidentally harassed by the project will depend on the distribution and abundance of marine mammals in the vicinity of the survey activity. However, we find that the number of potential takings authorized (by level B harassment only), which we consider to be a conservative, maximum estimate, is small relative to the relevant regional stock or population numbers, and that the effect of the activity will be mitigated to the level of least practicable impact through implementation of the mitigation and monitoring measures described previously. Based on the analysis contained herein of the likely effects of the specified activity on marine mammals and their habitat, we find that the total taking from the activity will have a negligible impact on the affected species or stocks.

Impact on Availability of Affected Species for Taking for Subsistence Uses

There are no relevant subsistence uses of marine mammals implicated by this action. Therefore, we have determined that the total taking of affected species or stocks would not have an unmitigable adverse impact on the availability of such species or stocks for taking for subsistence purposes.

Endangered Species Act (ESA)

There are no ESA-listed marine mammals expected to occur in the action area. Therefore, the Navy has not requested authorization of the incidental take of ESA-listed species and no such authorization is issued; therefore, no consultation under the ESA is required.

National Environmental Policy Act (NEPA)

In compliance with the National Environmental Policy Act of 1969 (42 U.S.C. 4321 et seq.), as implemented by the regulations published by the Council on Environmental Quality (40 CFR parts 1500-1508), the Navy prepared an Environmental Assessment (EA) to consider the direct, indirect and cumulative effects to the human environment resulting from the wharf recapitalization project. NMFS made the Navy's EA available to the public for review and comment, in relation to its suitability for adoption by NMFS in order to assess the impacts to the human environment of issuance of an IHA to the Navy. Also in compliance with NEPA and the CEQ regulations, as well as NOAA Administrative Order 216-6, NMFS has reviewed the Navy's EA, determined it to be sufficient, and adopted that EA and signed a Finding of No Significant Impact (FONSI) on November 20, 2013. The Navy's EA and NMFS' FONSI for this action may be found at <http://www.nmfs.noaa.gov/pr/permits/incidental.htm>.

Authorization

As a result of these determinations, we have issued an IHA to the Navy to conduct the specified activities in Naval Station Mayport, FL for one year, from December 1, 2013, through November 30, 2014, provided the previously described mitigation, monitoring, and reporting requirements are incorporated.

Dated: November 25, 2013

Donna S. Wieting,
Director,
Office of Protected Resources,
National Marine Fisheries Service.

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